

di/dt Rating

Critical rate of rise of on-state current. It is the rate at which anode current increases and must be less than rate at which conduction area increases.

To prevent damage to SCR by high di/dt value, small inductance is added in series with device. Value of required inductance is

$$L \geq \frac{V_p}{(di/dt)_{\max}}$$

dv/dt Rating

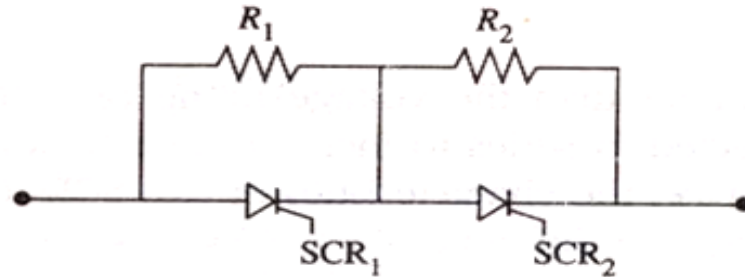
Maximum rise time of a voltage pulse that can be applied to the SCR in the off state without causing it to fire. Unscheduled firing due to high value of dv/dt can be prevented by using RC snubber circuit.

Series and Parallel SCR Connections

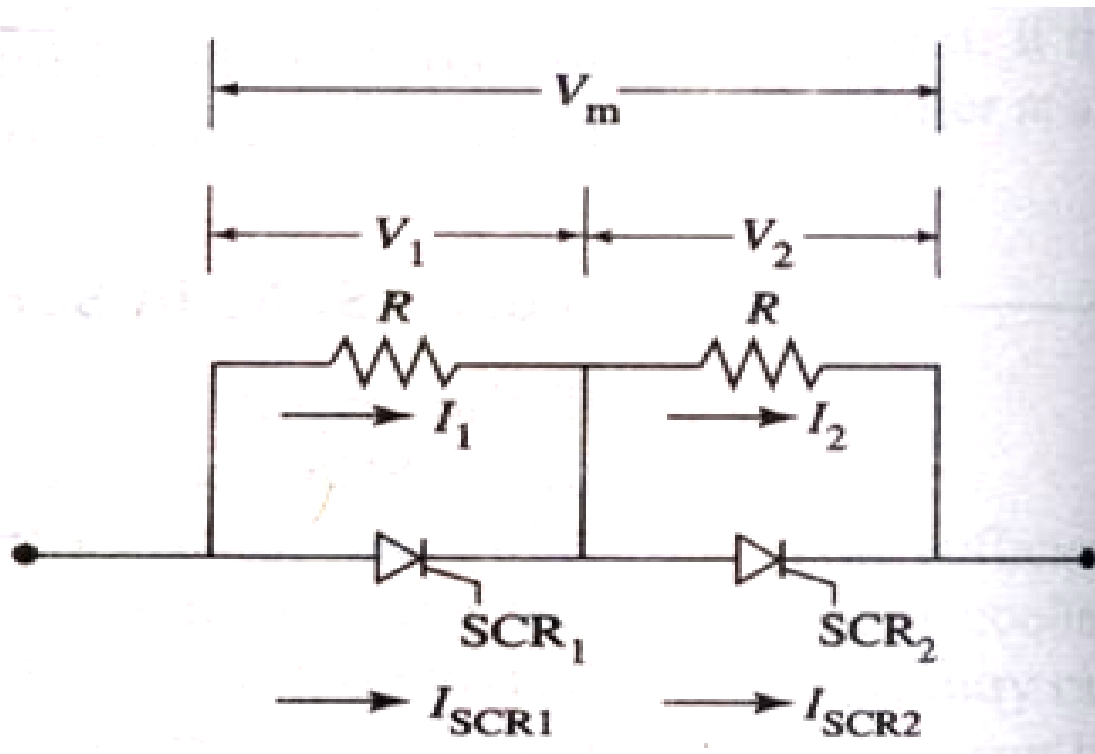
SCRs are connected in series and parallel to extend voltage and current ratings.

For high-voltage, high-current applications, series-parallel combinations of SCRs are used.

- Resistance equalization

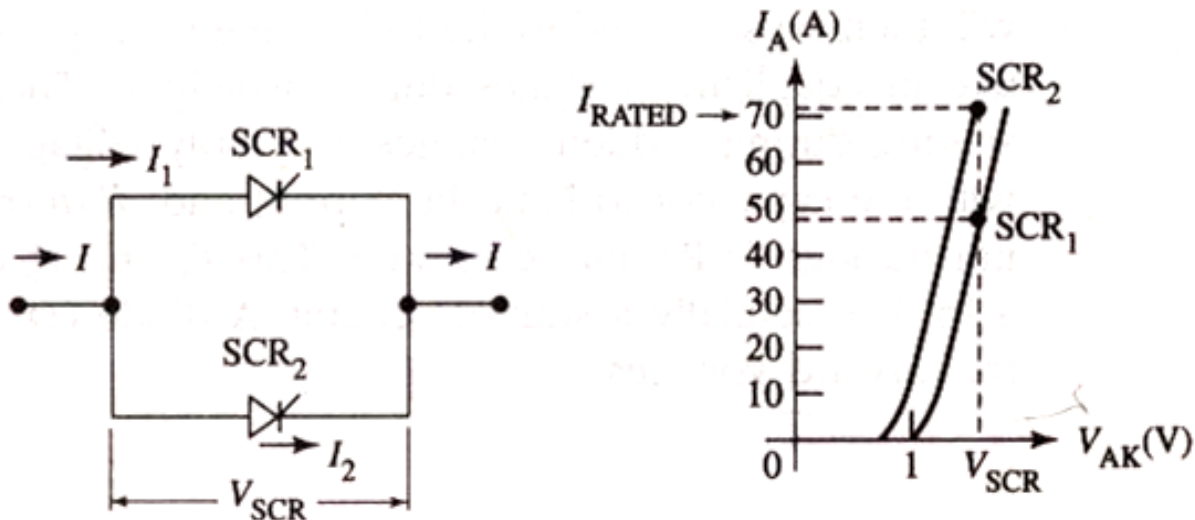


- Voltage equalization



SCRs In Parallel

- Unequal current sharing between two SCRs is shown:



- Total rated current of parallel connection is I_1+I_2 , not $2I_2$.

➤ What is Commutation?

The process of turning off an SCR is called commutation.

It is achieved by

1. Reducing anode current below holding current
2. Make anode negative with respect to cathode

➤ Types of commutation are:

1. Natural or line commutation
2. Forced commutation